

Patent claims

1. Process for the preparation of dentures, comprising the steps:
 - a) preparation of a blank,
 - b) processing of the blank by milling methods,
 - c) dense sintering of the blank in a temperature range from 1200 to 1650°C,the blank comprising a pre-sintered material and having a raw breaking resistance from 15 to 28 MPa.
2. Process according to claim 1, the blank having a raw breaking resistance of 23 to 28 MPa.
3. Process according to one of claims 1 or 2, in which, during the milling of the blank, the tool of the processing machine operates at a speed of 5,000 to 40,000 rpm and a feed rate of 20 to 5,000 mm/min during the rough processing and a speed of 5,000 to 50,000 rpm and a feed rate of 20 to 5,000 mm/min during fine processing and in each case with a milling diameter of 0.8 to 4 mm.
4. Process according to one of the previous claims, the blank being processed from the side in contact with the tooth stump and from the side not in contact with the tooth stump.
5. Process according to one of the previous claims, the pre-sintered blank comprising zirconium oxide or aluminium oxide ceramic.
6. Denture part which can be prepared according to a process according to one of claims 1 to 5.
7. Pre-sintered blank made from zirconium oxide ceramic, containing:

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- (A) 91 to 98.45 wt.-% zirconium oxide,
 - (B) 0 to 3.5 wt.-% hafnium oxide,
 - (C) 1.5 to 6.0 wt.-% yttrium oxide,
 - (D) 0.05 to 0.50 wt.-% of at least one of the oxides of the elements aluminium, gallium, germanium, indium,
 - (E) 0 to 1.9 wt.-% coloring additives (calculated as oxides),

10 the wt.-% having to add up to 100 and the blank having a raw breaking resistance of 15 to 30 MPa.

8. Pre-sintered blank according to claim 7, containing

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- (A) 91 to 98.35 wt.-% zirconium oxide,
 - (B) 0 to 2.5 wt.-% hafnium oxide,
 - (C) 1.5 to 6.0 wt.-% yttrium oxide,
 - (D) 0.15 to 0.50 wt.-% of at least one of the oxides of the elements aluminium, gallium, germanium, indium,
 - (E) 0 to 1.9 wt.-% coloring additives,

20 the wt.-% having to add up to 100.

9. Pre-sintered blank according to claim 7, containing

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- (A) 91 to 98.45 wt.-% zirconium oxide,
 - (B) 0 to 3.5 wt.-% hafnium oxide,
 - (C) 1.5 to 6.0 wt.-% yttrium oxide,
 - (D) 0.05 to 0.50 wt.-% aluminium oxide,
 - (E) 0 to 1.9 wt.-% coloring additives,

30 the wt.-% having to add up to 100.

10. Pre-sintered blank according to one of claims 7 to 9, having a raw breaking resistance of 25 to 28 MPa.

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A₃ 5 11. Pre-sintered blank according to one of claims 7 to 10, obtained by sintering at a temperature of 850°C to 1000°C.

12. Pre-sintered blank according to one of claims 7 to 11, having a deviation from the linearity of the shrinkage per spatial direction below 0.05%.

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13. Use of a blank of pre-sintered material with a raw breaking resistance of 15 to 30 MPa in a process for the preparation of dentures, the blank being processed before the dense sintering.

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A₄ 15 14. Process for the preparation of dentures according to one of claims 1 to 5, a blank according to one of claims 7 to 12 being processed by milling into a shrinkage-matched, enlarged model of the end dentures and densely sintered to its end dimensions.

- 20 15. Process for the preparation of dentures according to one of claims 1 to 5, a blank according to one of claims 7 to 12 being processed by CAD/CAM processes to a shrinkage-matched, enlarged model of the end dentures and densely sintered to its end dimensions.

- 25 16. Process according to one of claims 14 or 15, the pre-sintered blank being aesthetically re-processed after the processing and densely sintered to its end dimensions.